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ABSTRACT

Comparisons are drawn between the Keller Plan in Britain and Distant Learning in Germany in the areas of: (1) fundamental aims of education; (2) instructional materials and instructional systems; (3) guidance and direction of the learning process; (4) social learning; (5) assessment and examinations; (6) study techniques; (7) teacher training; and (8) cost-benefit. It is concluded that the Keller Plan provides a microcosm of an open university system in many ways, and that some of the problems the British Keller Plan and the German Distant Learning system have in common can be studied more easily through the kind of detailed investigation made possible by the small scale of the Keller Plan and its close contact between staff and students. It is also concluded that there are matters fundamental to individual study that transcend variations in conditions and circumstances. (23 references) (GL)

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L.R.B. Elton

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Zentrales Institut für Fernstudienforschung
Hagen, Juli 1978

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CAN KELLER PLAN HELP IN OUR UNDERSTANDING OF THE PROBLEMS OF DISTANT LEARNING ?

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1. Introduction

In an analysis of the experience of the first fifteen months of the German Fernuniversität (University at a distance), Peters lists a number of conclusions[1]. It is the purpose of the present paper to relate these to conclusions reached on the basis of experience with Keller plan courses, mainly in Great Britain[2]. Naturally, there are many differences due to differences in the instructional systems, as well as the countries; nevertheless the similarities would appear to be sufficient to make the comparison valuable.

Peters starts by listing three restrictions (R1 - R3 below) which have to be accepted in the creation of a distant learning system. Briefly, these are:

R1. Educational technology does not provide a general, theoretical basis on which to build an instructional system, since it derives from educational practice rather than theory.

R2. Attempts to use educational technology as an instructional science have led to a theoretical perfectionism which cannot be maintained in practice.

R3. Because of the lack of a sound theoretical foundation, educational technologists find it difficult to have their expertise accepted by subject specialists.

In contrast there are positive conclusions (P1 - P6 below), which can be set against these restrictions. They are:

P1. Educational technologists can help and stimulate authors of distant learning materials.

P2. Empirical research findings into learning - particularly in the areas of the use of media and of learning in small groups - have been found increasingly useful by course teams.

P3. Formative evaluation can usefully take three forms:

(a) Feedback from groups of students during the pilot stage, to improve the acceptability of the materials.

(b) Textual analysis of the didactic structure of the materials.

(c) Feedback from tutors and students during the actual study process, mainly to improve the context in which teaching and learning take place.

P4. It is possible to observe and give direction to the learning processes of large groups of students.

P5. Study centres can be used to improve deliberately the oral competence of students.

P6. Ways of identifying the roles of teachers and students in distant learning systems are being investigated.

Peters concludes his paper with some perceptive remarks concerning the difficulties of moving teachers from a traditional to a new role, even when they are convinced of the value of a new system and wish to assist in its introduction, and he relates this to the differences that exist between subject disciplines in their traditions and conventions.

I shall refer to Peters's conclusions R1 - 3, P1 - 6 at intervals throughout this paper.

2. Common problems in Keller plan and distant learning

In attempting to relate Peters's conclusions to my own experience and that of colleagues with the Keller plan, I shall touch on a number of problems. These are:

(a) Fundamental aims of education.

(b) Instructional materials and instructional systems.

(c) Guidance and direction of the learning process.

(d) Social learning.

(e) Assessment and examinations.

(f) Study techniques.

(g) Teacher training.

(h) Cost-benefit.

It is not my purpose to deal with any of these exhaustively, but rather to draw attention to some of the differences and similarities between Keller Plan in Britain and Distant Learning in Germany, and what lessons we may be able to learn from the comparison. This is not of course to deny the very valuable lessons that can be learnt from a similar comparison between the British Open University and the German Fernuniversität. Any lessons to be learnt from a comparison with British Keller plan experience must be complementary to this.

The question may well be asked whether the British Keller plan experience is at all relevant to the German Fernuniversität, and I would indeed have had doubts about this before reading Peters's article. However, his conclusions seemed in so many ways to echo my own that the relevance of the comparison became very apparent. It would seem that in many ways the Keller plan provides a microcosm of an Open University system and that some of the common problems can be studied more easily through the kind of detailed investigations made possible by the small scale of the Keller plan and its close contact between staff and students. Further, the scale of the German Fernuniversität is substantially smaller than that

of the British Open University and to that extent somewhat closer to Keller plan.

3. Fundamental aims of education

To me one of the main aims of any educational process lies in the furthering of the intellectual and ethical development of the individual student. Perhaps the most perceptive analysis of the stages of this development is that of Perry[3], and I have attempted to relate this to a much simpler scheme of my own, in which students move from dependence on their teachers via independence towards interdependence with others[4]. The essential paradox here lies in the fact that this process, which leads to the student eventually becoming independent of the teacher, requires the teacher's guidance if it is to be successful. This guidance should however become progressively less directive. In principle, the Keller plan - as well as other methods of individualised learning - allows students freedom in four areas:

(a) When and where to study - through self-pacing in private study.

(b) How to study - through different methods and media.

(c) What to study - through choice of content.

(d) How to be assessed - through the offer of several assessment methods.

In practice, the Keller Plan invariably allows (a), rarely (b) and (c), and virtually never (d). Probably (a) is in general quite enough for the first year undergraduate in a traditional university to have to deal with, but I have also had some success with (b) through the parallel provision of taped and printed material, and with (c) through the provision of optional work units and different routes through a course. (See section 4.) I regret that there appear not to have been any attempts anywhere within Keller plan at allowing students to choose their own assessment methods.

When it comes to the more mature students, usually found in distance study, one would expect that they would be given substantially more freedom. However, an analysis of distant learning systems does not show this and, in particular, choice of content is frequently confined to an initial decision regarding the course to be taken, after which

there is little choice[5]. Mature students in traditional universities are treated similarly[6]. Halberstadt has suggested[7] that the reason for this is that guidance through media can essentially only be guidance by others, i.e. the distant teacher, and that self-guidance, which requires rapid feedback to the learner can only be achieved through the immediacy of social interaction. I believe this to be too pessimistic a view, as I will show later in this paper.

However, this brings me to the question of how to achieve interdependence, since this clearly does require social interaction. My own small attempt at furthering co-operative study[4] seemed promising, and it raises the whole question as to how group learning can be organised within an individual learning system to which I want to return in section 6.

Before closing this section, I would like to refer to an issue which is much more alive in Germany than in Britain, i.e. how far universities should be agencies of deliberate social change. This issue dominated the events of 1968 in both countries, but very much more in Germany. The students of 1968 have become the teachers of 1978, but the students of 1978 are much more like the teachers of 1968, and this is particularly true of mature students, who may have been repelled by the student movement of 1968 and are in any case now likely to be more motivated by the wish to improve their position within the society they live in, than to change that society. Teachers who do not accept this very reasonable attitude are not likely to be of help to such students. They should also realize that such students may well have an evolutionary influence on society in the same direction as and more successful than the revolutionary students of 1968.

4. Instructional materials and instructional systems

Instructional materials are of two kinds; they are either complete in themselves or they supplement existing textbooks. Much of the Open University material comes into the former category, almost all Keller plan material comes into the latter. The usual reason given for this is that it would be prohibitively expensive to create totally new materials for each Keller plan course, although ideally it should be done (R2). For a long time I believed this myself, on the basis of myself having written a textbook which had shown up serious inadequacies under Keller plan use.

More recently, a most thought provoking analysis by Weltner [8,9] into the nature of textbooks and learning materials, has made me realize that the matter is not so simple. Weltner points out that traditionally textbooks have to fulfil two functions: they assist in the initial teaching of a subject and they are used for reference subsequently. These functions are to some extent in conflict and this is particularly so when a textbook has been designed for self-study. In self-study it is necessary to proceed slowly and explain every step most carefully as one goes along. This results - most obviously in programmed learning texts - in redundancies which are essential for first learning, but which get in the way when the reader later wishes to obtain a more general view or to revise his knowledge.

Weltner concludes that the two functions cannot be simultaneously fulfilled by the same material and thereby gives a theoretical justification to what previously had been thought of as a matter of expediency in Keller plan practice. In turn, the empirical success of the combination of textbook and instructional notes in Keller plan courses supports Weltner's arguments.

Which textbook to use and whether the instructional notes are adequate can only be found out through evaluation (P3). Although educational technology can help in making a reasonable first attempt (P1 and P2), it can never guarantee, without evaluation, an adequate final version. (R1). All experience, particularly that of the Open University, confirms that.

Another conclusion which emerges from Keller plan practice is that most Keller plan courses have been foundation courses with comparatively low level objectives. This may well be, because this is the area where anyone would reasonably start, but the Keller plan has now been long enough with us for this not to be an adequate reason. Weltner[9] suggests that the very nature of learning materials makes higher learning objectives more difficult to achieve, since these depend on the ability to generalize and interconnect. However, I believe that a more powerful reason may lie in the behaviourist approach on which much Keller plan practice is based. The insistence on "mastery" and strictly behavioural objectives is liable to restrict objectives to low levels[10]. Some of the British experience[2] indicates that less insistence on strict mastery and greater insistence on raising the level of objectives

is not necessarily detrimental to the Keller plan approach.

An experience in Keller plan, which leads from materials to systems, is that the progression through units does not have to be linear. Courses in blocks, with optional units or with branches have all been successfully constructed.[11] (See Fig.1). Since these more complicated schemes require students to have all the course material at the beginning, it is important to note that the original practice, based on behaviourist theory, of issuing a unit only after the test on the previous one had been successfully completed, has been frequently abandoned, without any apparent loss of motivation. A similar practice is not uncommon in commercial correspondence courses, but could clearly run into trouble financially in distant learning courses in which fees do not cover costs.

Finally, a Keller plan course could be used as part of more general systems, such as in support of project work, where students often find they need to learn some specific area of knowledge. For this to be possible it would be necessary to have a substantial library of such courses available, and this does not appear yet to be possible anywhere.

5. Guidance and direction of the learning process

I have already referred to the essential paradox contained in the phrase "guiding towards independence" and Halberstadt's pessimistic view[7] that distant learning materials cannot be used in a self-guided way. This view is contradicted by the experience of those who have studied genuinely on their own, without the help of study courses. Such students, technically known as autodidacts, select their own books and other study materials and any interactions they have with other people are initiated by them. They are often very successful in this mode of study, but they are naturally rare among the young students who are normally taking Keller plan courses. Nevertheless, I wish to record that since I issued all the units at the beginning of my courses, there have been a few students who never took the unit tests and yet did very satisfactorily in the end of course examination. Students who never take any tests and yet pass their final examinations are of course not unknown in distant learning either.

However, there is little doubt that for most people the best way to learn to guide oneself is through interaction with others. These may be teachers, who initially are providing the guidance but are gradually transferring this task to the students, or fellow students who are also engaged in the process of becoming self-guided. The reason for this was given by Halberstadt.[7] It is that guidance is a cybernetic process which requires feedback in order to be effective and only the autodidact can obtain this feedback from within himself. In the Keller plan the feedback from teachers arises largely during the test sessions, when tutors and students jointly work through and discuss a completed test before deciding whether it has been completed successfully or not. This feedback, which provides both guidance and support, is a vital part of the Keller plan. Both these functions are also fulfilled by the corresponding part of a distant learning system[12] - the posting of exercises to a tutor and having them returned with comments and corrections - but the lack of interaction in the process is liable to make it less effective. To overcome this defect, it may be possible for student and tutor to go through the exercise together over the telephone rather than use the post. Where a computer is used to mark some of the exercises, as in the Open University, an interactive mode of using the computer should be considered. The advent of systems such as Viewdata, which bring computer print-outs onto the television screen at home via the public telephone system will soon make this technically feasible. Needless to say, all such interactions also provide invaluable feedback for the teacher (P3).

Interaction with other students does occur in Keller plan, although it is not part of the official system, which from the start impresses on students that they are working at their own pace. As a consequence of this, they often do not know who of their colleagues is at the same place of the course as they are. A way to overcome the resulting sense of isolation is to provide a learning centre [4,13] dedicated to one or more courses. Interactions between different students all working in the same Centre are quickly established, and the study centres of the Open University have been known to fulfil a similar function.

Here is is necessary to make an important reservation. Not all feedback is always beneficial and the knowledge that others are forging

ahead has occasionally been found to have an aversive effect on slower students.[14] On the other hand, the same knowledge, when used by teachers, has made it possible to give special help to such slow students and in this way to direct the teaching effort onto a particular sub-group of a large student body(P4).

6. Social learning

The term "social learning" serves to denote all those learning situations in which students are expected to interact with each other. Such situations, in which a number of students come together with a teacher, are frequently used in traditional university teaching to go over material previously presented in lectures. This is exceedingly wasteful and with good lectures should not be necessary. It is therefore worth noting that this remedial function of the teacher is hardly ever found necessary in Keller plan courses. On the other hand, it is true that some students do find individual learning difficult, but these are best helped by fellow students, as has been found in the study centres of the Open University, where self-help groups have sprung up spontaneously. My own experience with tutor-less groups has been similar.[4]

The main purpose of tutorial groups should be to achieve aims for which social interaction is a necessity.[15] Many of these aims are affective, but they also include cognitive skills, such as the ability to discuss (P5). Such skills have been taught successfully in courses which combined group interaction and individualized learning[16] and through peer learning.[17] It is worth noting however that certain aims which are frequently thought to require personal contact can in fact be achieved without them. Psychomotor skills, such as laboratory skills, have been taught through videotapes and - to take an example from outside education - both Roosevelt and Hitler used radio most effectively to change and form attitudes.

A second purpose of the tutorial group is to maintain the morale of the students and to overcome what has become known as "the loneliness of the long distance learner", after the novel with a similar title ("The loneliness of the long distance runner"). The important

contribution that Keller plan experience can make to both these purposes of tutorial groups in distant learning is to identify those which are most vital and which cannot be achieved by other means, so that this most expensive part of a distant learning system can be used most effectively (P2).

7. Assessment and examinations

Most students find some extrinsic form of motivation at times necessary in their work and Holmberg[4] quotes one finding from a distant learning course that 93 per cent of the students on it said that they would have been less motivated, had there been no homework to send in and be corrected. As is well known, the Keller plan capitalizes on this form of motivation by making it an essential part of the course structure.[19] Examinations are the most extreme method by which this kind of motivation is provided and it can be argued[20] that in our society examination grades have the same effect on students that monetary rewards have on the rest of us. Now working for nothing is unreasonable while working solely for money is undesirable. We should take the same view towards the relationship of examinations to student learning.

Mature students on the whole prefer course work assessment to terminal assessment. The Open University uses both, giving a proportion of the final grade on the grades obtained through course work. This is also the practice in many Keller plan courses. One problem that has then to be faced is that it is often difficult to be sure of the extent to which a student has had help with course work or, in extreme cases, whether it is his work at all. The oral discussion of the test work in the Keller plan often makes this clear, and course work assessment might be more acceptable in distant learning if the course work were associated with oral discussions, such as the telephone method which I suggested in section 5.

8. Study techniques

Keller plan courses face students with the need to study in until then to them unfamiliar ways, yet few attempts seem to have been made to help them. My own contribution consists of the inclusion of some

specific study advice within the instructional notes for an initial university course in mechanics. Its effectiveness was evaluated in some detail at the end of the first year by Hodgson and her evaluation[21] was sufficiently encouraging for me to repeat the work in the following year, when I evaluated it by means of a questionnaire. This second group of students was then followed through into its second year to see whether any of the study advice had taken root. The kind of advice given and the results of the questionnaires are shown in Table 1. Advice which was very specific to my course was omitted from the follow-up enquiry. When it is remembered that the Keller plan method of work may necessitate the modification and even breaking of some very firmly established and rather passive study habits, the results shown in the table give ground for hope.

The aspect of the advice which I wish to stress in connection with its relevance to distant learning (P6) is that it was particular to the course and integrated with it. As such it is much more likely to be of use than general advice given at the beginning of the course. This is clearly evident from the table, where three of the four most popular pieces of advice were specific to the course. The high responses in the following year to "discuss with other students" and "looking up references in the library" may in part be due to the fact that both were modes of work needed in the second year laboratory course.

9. Teacher training

Just as Keller plan is new for students, so it is new for teachers. Yet most of the advice offered to teachers is confined to the teacher's role as tutor in the test situation. For the crucially important task of production of the study materials little is available, although a careful reading of the accumulated British experience[2] should be helpful. This lack of professional advice may well account for the comparatively low standing of the experts in the field in relation to their colleagues in academic disciplines (R3), and one can only hope that here Keller plan enthusiasts will learn from their colleagues in the distant learning field (P1, P6).

10. Cost-benefit

The cost-benefit of British Keller plan courses has been discussed by Black and Boud.[22] It is easy to demonstrate that Keller plan cannot be as cheap as the mass lecture, particularly when the initial preparation of materials is included in the cost, but once considerations of benefit are included, no easy calculations are possible. Similar conclusions have been reached in connection with distance study[7] and indeed more generally.[23] As in most of education, process is at least as important as product and the long term benefit for instance on study habits of having been through the experience of a self-instructional course is impossible to assess in financial terms. Let it rest here.

11. Conclusion

This paper has attempted to draw comparisons between two educational systems that might have been considered so different from each other, that no comparisons could sensibly be drawn. That it was nevertheless possible to do so is an indication that there are matters fundamental to individual study that transcend variations in conditions and circumstances.

Acknowledgments

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June 1978
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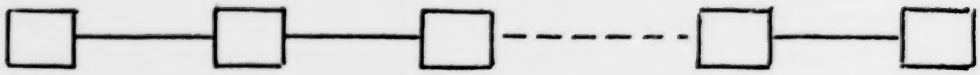
TABLE I

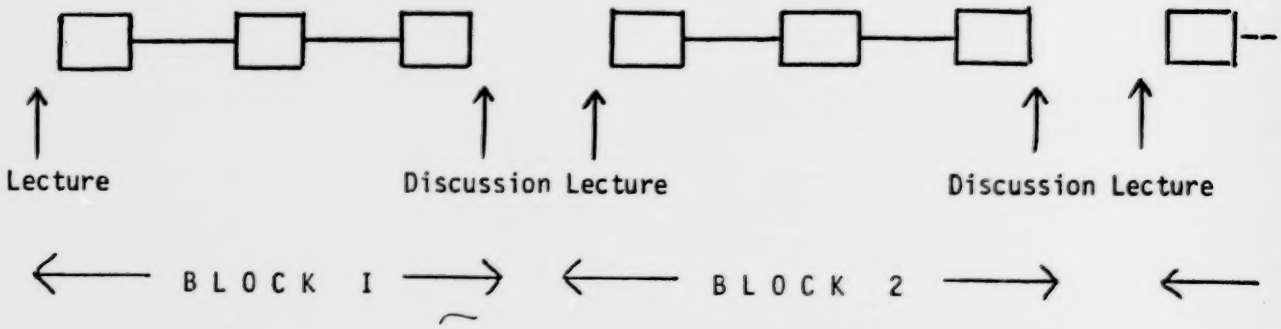
Advice	Agree with it %	Follow it %	Follow it a year later %
Always work over worked examples	89	66	-
Always do progress tests	84	64	-
Do problems before looking at solutions	82	50	64
Use list of objectives as check list	75	43	-
Take short rest periods while studying	70	39	61
Make lists of key points while note taking	80	36	32
Discuss difficult passages with other students	57	25	43
Use audiotapes if necessary	61	23	-
Look up references in the library	57	20	52
Use the suggested reading strategy	43	18	14

FIGURE 1 MODELS FOR A KELLER PLAN COURSE

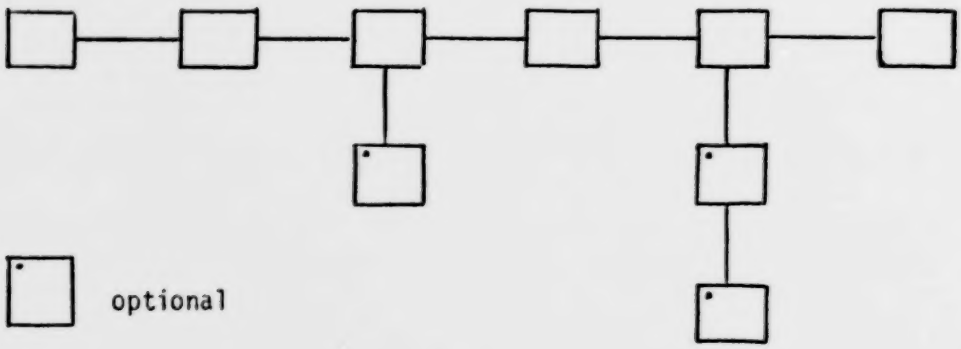
(a) LINEAR COURSE



(b) BLOCKED COURSE



(c) COURSE WITH OPTIONAL UNITS



(d) COURSE WITH BRANCHES